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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,686	08/25/2003	Daishi Yoshikawa	116925	9969
25944	7590	06/14/2007		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER CANTELMO, GREGG	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 06/14/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/646,686

Applicant(s)

YOSHIKAWA, DAISHI

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 3/27/07 AND 2/28/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 7-18 is/are pending in the application.
- 4a) Of the above claim(s) 7-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 27, 2007 has been entered.

### ***Response to Amendment***

2. In response to the amendment received February 28, 2007 and entered as per the RCE filed March 27, 2007:
- a. Claims 7-18 are pending with claims 7-16 withdrawn from consideration as to a non-elected invention. Action on the merits of claims 17 and 18 is set forth herein;
  - b. The 112 rejection has been withdrawn in light of the amendment to claim 17.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claim 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denton in view of U.S. Patent No. 6,437,011 (Steck) and WO 02/33709 (WO '709).

Denton discloses an electrolyte membrane comprising an inorganic glass fiber substrate impregnated with a proton conducting perfluorosulfonic acid (Example 1 as applied to claims 17-21). The proton conducting polymer and

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glass fiber substrate are integral with respect to one another (as applied to claims 19 and 20).

The differences between claim 17 and 18 and Denton is that Denton does not teach of the glass being a woven glass of the particular configuration recited in claims 17 and 18 or of the sheet embedded portion of the matrix being between 30% to 80% of the entire thickness of the matrix.

As to the glass being the particular configuration:

Use of both woven and non-woven glass materials as a mechanical core or substrate for a proton conducting electrolytic membrane is known in the art as shown by Steck (col. 10, ll. 55-60). Furthermore the instant application discloses that either woven or non-woven glass cores are suitable alternatives for the inorganic component of the membrane.

The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

As to the particulars of the fabric of the woven glass: First with respect to the size openings of the fabric and porosity, the ranges specified therein is a significantly vast range considering the membrane being employed as an electrolyte support membrane. Clearly, one of ordinary skill in the art would recognize that an electrolyte membrane would have 10-90% porosity so as to provide sufficient ionic conductivity across the glass fabric. Less than 10% porosity would adversely affect the ionic conductance of the fabric and thus make

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it an ineffective ion membrane support material. More than 90% porosity would obviously adversely affect the mechanical properties of the membrane which would create shorting between the electrodes. Thus a porosity range of 10-90%, which is an obviously vast porosity range, would have been clearly within the knowledge of one of ordinary skill in the art. Furthermore there is no clear evidence to show that this vast porosity range has any criticality. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

With respect to the size openings in the fabric:

As discussed above, the range specified therein is a significantly vast range considering the membrane being employed as an electrolyte support membrane. Clearly, one of ordinary skill in the art would recognize that optimization of the size openings would relate to the mechanical and ionic properties of the film, much the same way as the porosity, discussed above, would. Optimization of the spacing of the fabric provides for both improved mechanical support and ionic conductivity. Thus the claimed size openings would have been clearly within the knowledge of one of ordinary skill in the art since it would have optimized both the mechanical and ionic properties of the glass fabric support. Furthermore there is no clear evidence to show that this vast porosity range has any criticality. Generally, differences in ranges will not support the patentability of subject

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matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

With respect to the sheet embedded portion of the matrix being from 30% to 80% of the entire thickness of the matrix.

Fig. 2 of WO '709 suggests that it is known in the art to provide a fabric support which is embedded within the matrix of the electrolyte and wherein said support is substantially less than the entire thickness of the matrix.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of to embed the fabric which would thus have a thickness less than the overall thickness of the polymer electrolyte matrix as shown by WO '709 since it would have provided both excellent ionic conductivity along the outer surface of the electrolyte while providing improved mechanical stability from the embedded fabric within the electrolyte. As to the particular claimed range of 30%-80% the figure therein reasonably suggests a configuration wherein the embedded fabric is about half the overall thickness of the electrolyte and thus reasonably suggests thickness arrangements which would render the claimed relationship obvious. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406

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F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 17 and 18 have been considered but are moot in view of the new ground(s) of rejection.

The concept of embedding the fabric support in the electrolyte matrix is further held to be an obvious modification which would have been readily apparent to one of ordinary skill in the art as shown by WO '709.

### ***Conclusion***

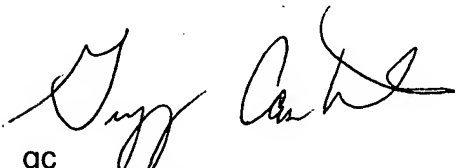
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



gc  
June 6, 2007

Gregg Cantelmo  
Primary Examiner  
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